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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/325,099	06/03/1999	ALEXANDER SHVARTS	4498	2396
55740	7590	07/11/2006		
GAUTHIER & CONNORS, LLP 225 FRANKLIN STREET BOSTON, MA 02110			EXAMINER KIM, KEVIN	
			ART UNIT	PAPER NUMBER
			2611	

DATE MAILED: 07/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 09/325,099	<b>Applicant(s)</b> SHVARTS ET AL.	
	<b>Examiner</b> Kevin Y. Kim	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5,7-12,14 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7-12,14 and 16-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed April 27, 2006 have been fully considered but they are not persuasive.

Applicant asserts that the translation loop modulator described in the Herzinger reference is capable of a dual mode operation. Before discussing the Herzinger reference, we need to understand how the present invention operates in first and second modes.

Fig.2 of the drawings show a down converter (52). The specification at page 6 explains that the polarity of the difference between the local oscillation signal LO and the transmitter output signal RF determines the loop will be operating in the first mode or the second mode. There is disclosed no switch or an equivalent to selective allow the two operations. In other words, the present invention merely describes that the claimed invention may be operated in the two modes. With this understanding of the present invention, the prior art translation loop modulator is looked at. Fig.2 of the prior art shows a mixer M1, which outputs the difference between the local oscillation signal  $f_{LO}$  and the transmitter output signal  $f_{VCO}$  with frequency dividers (FT1, FT2), a comparator (PFD) coupled in the same manner as the claimed invention. Thus, just as the present invention, the polarity of the difference between the local oscillation signal  $f_{LO}$  and the transmitter output signal  $f_{VCO}$  determines a mode of operation. Although the prior art reference does not describe a two-mode operation it is capable of such operation particularly since the claimed invention fails to recite any distinctive elements such that the inventive modulator is not just capable of two mode operations but also allows the alternation between two modes.

The declaration filed on the same day under 35 USC 1.132 was carefully reviewed but is insufficient to overcome the rejection in that it does not establish that the prior art translation loop modulator is not capable of the second mode where  $F_{LO} = F_{OUT} / (1 + m/n)$  when a particular polarity of the difference between the local oscillation signal  $f_{LO}$  and the transmitter output signal  $f_{VCO}$  is selected.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 102***

3. Claims 1, 5, 7-10, 14, 16-19, 21 and 22 are rejected under 35 U.S.C. 102(a) as being anticipated by Herzinger (EP 0 905 879 A1, previously cited).

Claim 1.

Herzinger discloses a translation loop modulator (see Fig. 2 and the English abstract) for transmission circuit in a communication system, said translation loop modulator comprising:

1) input modulation means ("QM" and "BP") for receiving at least one input signal (" $f_I$ " and " $f_Q$ ") that is representative of information to be modulated, for receiving a feedback signal ( $f_{MO}$ ), and for producing an intermediate modulated signal (output from "BP" responsive to said input signal and said feedback signal);

2) comparator means ("FT1" "FT2" "PFD" "CP" "LF" and "HF-VCO") for receiving said intermediate modulated signal (output from "BP") and a reference signal (" $f_{LO}$ ") having a frequency of  $F_{LO}$ , and for producing an output transmission signal ("A" having a frequency of  $f_{VCO}$  responsive to said intermediate modulated signal and said reference signal, wherein said comparator means includes a first frequency divider unit ("FT1") for providing a divide by m

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function and a second frequency divider unit ("FT2") for providing a divide by n function such that  $f_{LO} = f_{VCO} / (1 - m/n)$  (see the mathematical expression in col. 4, line 49, also see right column on page 3 of the English translation of DE 19743207 provided by the applicant), and

3) feedback circuitry ("M1" and "TP") coupled to said output transmission signal ("A"), coupled to said reference signal (" $f_{LO}$ ") and coupled to said input modulation means ("QM" and "BP"), said feedback circuitry for producing said feedback signal (" $f_{MO}$ ") responsive to said output transmission signal and said reference signal.

The claim appears to be different in that it further describes that the two frequency divider are provided such that the translation loop module operates in a second mode where  $F_{LO} = F_{OUT} / (1 + m/n)$ . However, up on a closer look, the claimed invention recites no mechanism to switch between two modes. It merely defines that, presumably by a selection element (but not recited), the module could operate in either mode. In that sense, the translation loop module, having all the claimed elements of the claimed invention, is equally capable of operating in the two modes, where in the second mode the difference  $f_{VCO} - f_{LO}$  is taken instead of  $f_{LO} - f_{VCO}$ , resulting in  $F_{LO} = F_{OUT} / (1 - m/n)$ .

In other words, all the elements of the claimed invention are found in the Herzinger reference.

#### Claim 5.

Herzinger also teaches an input port of said second frequency divider unit ("FT2") is coupled to said reference signal ( $f_{LO}$  output from "LO"), and an output port of said second frequency divider unit is coupled to a phase comparator device (PFD).

Claim 7.

Herzinger also teaches an input port of said first frequency divider unit ("FT1") is coupled to said intermediate modulated signal (the output from "BP" in Fig. 2), and said output port of said first frequency divider unit is coupled to a phase comparator device ("PFD").

Claim 8.

Herzinger also teaches said feedback circuitry ("M1" and "TP") includes a mixer device ("M1") including a first input port coupled to said output transmission signal ("A"), a second input port coupled to said reference signal ("f<sub>LO</sub>"), and an output port coupled to said feedback signal ("f<sub>MO</sub>").

Claim 9.

Herzinger also teaches said reference signal is directly connected to said mixer device (as seen in Fig. 2, the reference signal "f<sub>LO</sub>" is directly connected to the mixer device "M1").

Claim 10.

Herzinger discloses a translation loop modulator (see Fig. 2 and the English abstract) for transmission circuit in a communication system, said translation loop modulator comprising:

1) input modulation means ("QM" and "BP") for receiving at least one input signal ("f<sub>I</sub>" and "f<sub>Q</sub>") that is representative of information to be modulated, for receiving a feedback signal

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( $f_{MO}$ ), and for producing an intermediate modulated signal (output from "BP" responsive to said input signal and said feedback signal);

2) comparator means ("FT1" "FT2" "PFD" "CP" "LF" and "HF-VCO") for receiving said intermediate modulated signal (output from "BP") and a reference signal (" $f_{LO}$ ") having a frequency of  $F_{LO}$ , and for producing a phase comparator signal responsive to said intermediate modulated signal and said reference signal, wherein said comparator means includes a first frequency divider unit ("FT1") for providing a divide by m function and a second frequency divider unit ("FT2") for providing a divide by n function;

3) oscillation means("HF-VCO") for receiving said phase comparator signal (output from "LF") and for producing an output transmission signal ("A" in Fig. 2) responsive to said phase comparator signal, said output transmission signal having a frequency such that  $f_{LO} = f_{VCO} / (1 - m/n)$  (see the mathematical expression in col. 4, line 49, also see right column on page 3 of the English translation of DE 19743207 provided by the applicant), and

4) feedback circuitry ("M1" and "TP") coupled to said output transmission signal ("A"), coupled to said reference signal (" $f_{LO}$ ") and coupled to said input modulation means ("QM" and "BP"), said feedback circuitry for producing said feedback signal (" $f_{MO}$ ") responsive to said output transmission signal and said reference signal.

The claim appears to be different in that it further describes that the two frequency divider are provided such that the translation loop module operates in a second mode where  $F_{LO} = F_{OUT} / (1 + m/n)$ . However, up on a closer look, the claimed invention recites no mechanism to switch between two modes. It merely defines that, presumably by a selection element (but not recited), the module could operate in either mode. In that sense, the translation loop module,

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having all the claimed elements of the claimed invention, is equally capable of operating in the two modes, where in the second mode the difference  $f_{VCO} - f_{LO}$  is taken instead of  $f_{LO} - f_{VCO}$ , resulting in  $F_{LO} = F_{OUT} / (1 - m/n)$ .

In other words, all the elements of the claimed invention are found in the Herzinger reference.

Claim 14.

Herzinger also teaches an input port of said second frequency divider unit ("FT2") is coupled to said reference signal ( $f_{LO}$  output from "LO"), and an output port of said second frequency divider unit is coupled to a phase comparator device ("PFD").

Claim 16.

Herzinger also teaches an input port of said first frequency divider unit ("FT1") is coupled to said intermediate modulated signal (the output from "BP"), and an output port of said first frequency divider unit is coupled to a phase comparator device ("PFD").

Claim 17.

Herzinger also teaches said feedback circuitry (M1 and TP) includes a mixer device ("M1" in Fig. 2) including a first input port coupled to said output transmission signal ("A" in Fig. 2), a second input port coupled to said reference signal (" $f_{LO}$ "), and an output port coupled to said feedback signal (" $f_{MO}$ " in Fig. 2).



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Claim 18.

Herzinger also teaches said reference signal is directly connected to said mixer device (as seen in Fig. 2, the reference signal " $f_{LO}$ " is directly connected to the mixer device M1.

Claim 19.

Herzinger teaches a translation loop modulator (see Fig. 2 and the English abstract) for a transmission circuit in a communication system, said translation loop modulator comprising:

quadrature modulation means (QM and BP in Fig. 2) for receiving at least one input signal (" $f_I$ " and " $f_Q$ ") that is representative of information to be modulated, for receiving a feedback signal ( $f_{MO}$ ), and for producing a quadrature modulated signal (output from "BP" in Fig. 2) responsive to said input signal and said feedback signal,

first frequency divider means (FT1) for receiving said quadrature modulated signal (output from BP), and for producing a first frequency divided signal (output from "FTI") responsive to said quadrature modulated signal such that said first frequency divider means provides a divide by m function,

second frequency divider means (FT2) for receiving a reference signal ( $f_{LO}$ ), and for producing a second frequency divided signal ( $f_{PD}$ ) responsive to said reference signal such that said first frequency divider means provides a divide by n function,

phase comparator means ("PFD" "CP" and "LF" in Fig. 2) for receiving said first frequency divided signal and said second frequency divided signal, and for producing a phase comparator signal (output from LF) responsive to said first and second frequency divided signals;

oscillator means (HF-VCO) for receiving said phase comparator signal (output from "LF" in Fig. 2), and for producing an output transmission signal ("A" in Fig. 2) having a frequency  $F_{OUT}$  responsive to said phase comparator signal such that  $f_{VCO} = f_{LO} (1 - m/n)$  (see the mathematical expression in col. 4, line 49; also see right column on page 3 of the English translation of DE 19743207 provided by the applicant); and

feedback circuitry ("M1" and "TP" in Fig. 2) coupled to said output transmission signal (A), coupled to said reference signal ( $f_{LO}$ ) and coupled to said quadrature modulation means ("QM" and "BP" in Fig. 2), said feedback circuitry for producing said feedback signal ( $f_{MO}$ ) responsive to said output transmission signal and said reference signal.

The claim appears to be different in that it further describes that the two frequency divider are provided such that the translation loop module operates in a second mode where  $F_{LO} = F_{OUT} / (1 + m/n)$ . However, up on a closer look, the claimed invention recites no mechanism to switch between two modes. It merely defines that, presumably by a selection element (but not recited), the module could operate in either mode. In that sense, the translation loop module, having all the claimed elements of the claimed invention, is equally capable of operating in the two modes, where in the second mode the difference  $f_{VCO} - f_{LO}$  is taken instead of  $f_{LO} - f_{VCO}$ , resulting in  $F_{LO} = F_{OUT} / (1 - m/n)$ .

In other words, all the elements of the claimed invention are found in the Herzinger reference.

Claim 22.

Herzinger discloses operating the translation loop module in GSM mode (about 900 MHz).

***Claim Rejections - 35 USC § 103***

4. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Herzinger, as applied to claim 19 above, in view of Damgaard et al. (U.S. Patent No. 6,208,875, cited previously).

Herzinger discloses all the subject matter claimed except for operating at about 1800 MHz. Damgaard et al teaches dual mode translation loop module which can operate at about 1800 MHz as well as at about 900 Mhz. Thus, it would have been obvious to one skilled in the art at the time the invention to select parameters of Herzinger's module such that it can operate at about 1800 MHz to provide communication capability for the DCS mode.

5. Claim 2, 3, 11, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herzinger, as applied to claims 1,10 and 19 above, in view of Jaffe (US Patent 5,130,670).

Claims 2,11 and 20.

Herzinger teaches the claimed including an oscillating means ("LO") for generating the reference signal ("f<sub>LO</sub>"), but fails to teach that the oscillating means is a reference loop modulator, i.e., a feedback loop configuration. Jaffe teaches that an oscillating means (16 in Fig. 4) is implemented with a phase locked loop (52', 54', 56', 58' 66, 64' 60' and 62' in Fig. 7). The phase locked loop comprises a stability enhancement circuit (66 in Fig. 7) so as to generate a stable output oscillating signal. It is desirable to generate a stable reference signal in the translation loop modulator of Herzinger so as to generate a stable output transmission signal (A).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the oscillating means of Herzinger with a phase locked loop,

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as taught by Jaffe, so as to generate a stable reference signal and consequently to generate a stable output transmission signal.

Claims 3 and 12.

Jaffe teaches the claimed limitation "said reference loop modulator includes a fractional n synthesizer" because Jaffe teaches that the oscillating means 16 is a fractional n synthesizer (col. 16, lines 62-63).

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

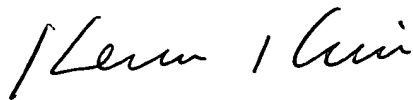
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

July 7, 2006

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A handwritten signature in black ink, appearing to read 'Kevin Kim', is written over the printed name.

**KEVIN KIM  
PATENT EXAMINER**